

Appl. No. 10/577,652
Amendment dated January 18, 2012
Reply to Office Action of September 26, 2011

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of claims:

1. **(Currently Amended)** Apparatus for delivering radiation to a target volume (46) beneath a skin surface, comprising:

a radiation source (16) for inputting a beam of said radiation having an input energy fluence; and

a beam conversion system (17) comprising:

a rotator (21) having a rotation axis in optical alignment with said beam and a first radiation directing element (24) arranged in optical communication with said radiation source comprising a reflective element rigidly mounted on said rotator having a symmetry axis (27), collinear with said rotation axis for rotating said input beam around said symmetry axis said first radiation directing element adapted to direct said beam in a plurality of directions spaced around said symmetry axis, and

a second radiation directing element (25) comprising a single reflective element mounted at a fixed distance from said rotation axis facing said first radiation directing element for redirecting said directed beam through said surface radially inwards towards said symmetry axis onto said at least one target volume (46) disposed on said symmetry axis beneath said skin surface, such that said radiation is spread out in a rotational path on said surface, wherein

said rotator is adapted to direct said beam in directions such that any given point of said target volume is exposed to said radiation during the entire energy excitation period of said beam, while any given point of said rotational path on said surface is exposed to said radiation only during portion of said energy excitation period, and

said first radiation directing element (24A) has reflecting surface with curvature in at most, one plane, and

said second radiation directing element (25) has reflecting surface (39) with curvature in at most, one plane, and

none of said radiation impinging on said skin surface overlaps with said symmetry axis, and

said energy fluence of said radiation at said target volume is higher than said energy fluence of said radiation at said skin surface.

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2. **(Cancelled)**
3. **(Previously Presented)** The apparatus according to claim 1 wherein said second radiation directing element is rigidly mounted on said rotator and is rigidly coupled to said first radiation directing element.
4. **(Previously Presented)** The apparatus according to claim 1 wherein said radiation has a spectral band between 300nm and 11000nm.
5. **(Currently Amended)** The apparatus according to claim 1, said first radiation directing element and said second radiation directing element are selected such that said energy fluence of said redirected beam radiation is less than or equal to said ~~input~~ energy fluence of said input beam.
6. **(Previously Presented)** The apparatus according to claim 1, said first radiation directing element and said second radiation directing element are selected such that the focal point of such beam is located beyond said target volume.
7. **(Previously Presented)** The apparatus according to claim 1 wherein said redirected radiation is in a collimated form.

8-14. **(Cancelled)**

15. **(Currently Amended)** A method for delivering radiation beneath a skin surface, comprising the steps of:

providing a radiation source for inputting a beam of said radiation having an input energy fluence; and

providing a rotator having a rotation axis in optical alignment with said beam; and providing a first radiation directing element arranged in optical communication with said radiation source comprising a reflective element rigidly mounted on said rotator having a symmetry axis, collinear with said rotation axis for rotating said input beam around said symmetry axis said first radiation directing element adapted to direct said beam in a plurality of directions spaced around said symmetry axis; and

providing a second radiation directing element comprising a single reflective element mounted at a fixed distance from said rotation axis facing said first radiation directing element for redirecting said directed beam through said surface radially inwards towards said symmetry axis onto said at least one target volume disposed on said symmetry axis beneath said skin surface, such that said radiation is spread out in a rotational path on said surface, wherein

any given point of said target volume is exposed to said radiation during the entire energy excitation period of said beam, while any given point of said

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rotational path on said surface is exposed to said radiation only during portion of said energy excitation period, and

said first radiation directing element has reflecting surface with curvature in at most, one plane, and

said second radiation directing element has reflecting surface with curvature in at most, one plane, and

none of said radiation impinging on said skin surface overlaps with said symmetry axis, and

said energy fluence of said radiation at said target volume is higher than said energy fluence of said radiation at said skin surface.

16. **(Currently Amended)** A method according to claim 15 and further comprising the step of providing a ~~single-second~~ reflective element rigidly mounted on said rotator and rigidly coupled to said first radiation directing element for rotating said input radiation around said symmetry axis, such that said radiation is spread out in a rotational path on said surface.

17-18. **(Cancelled)**

19. **(Previously Presented)** A method according to claim 15 and further comprising the step of providing a first radiation directing element and a second radiation directing element for converging said radiation onto said target volume without the use of elements having optical power.

20. **(Previously Presented)** A method according to claim 15 and further comprising the step of providing a first radiation directing element and a second radiation directing element wherein said radiation is non-focused at said target volume.

21. **(Original)** A method according to claim 16 and wherein said rotated radiation is in a generally collimated form.

22-25. **(Cancelled)**

26. **(Previously Presented)** The apparatus according to claim 1 wherein said beam conversion system converges said radiation onto said target volume without the use of elements having optical power.

27. **(Previously Presented)** The apparatus according to claim 1 wherein said second radiation directing element converges said radiation onto said target volume without the use of elements having optical power.

28-31. **(Cancelled)**

32. **(New)** The apparatus according to claim 1 wherein said period of said rotation is shorter than or equal to the duration of said energy excitation period.

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33. (New) The apparatus according to claim 1 wherein said energy excitation period is a multiple of said period of said rotation.

34. (New) The apparatus according to claim 1 wherein said energy excitation period is from 1 millisecond to 300 milliseconds.

35. (New) A method according to claim 15, and further comprising the step of providing a first radiation directing element and a second radiation directing element wherein said energy fluence of said redirected beam is less than or equal to said energy fluence of said input beam.